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# ***JPRS Report***

# **Science & Technology**

***Japan  
Facsimile Multiplex Broadcasting Technology***

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# Science & Technology

Japan

## Facsimile Multiplex Broadcasting Technology

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### CONTENTS

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[Report on facsimile multiplex broadcasting technology and policy by the MPT Study Group]

Report on Facsimile Multiplex Broadcasting Technology .....	1
Introduction .....	1
Chapter 1. Summary of Fax Multiplex Broadcasting .....	1
Chapter 2. How Fax Multiplex Broadcasting System Should Be Organized .....	4
Reference Material .....	11

## Report on Facsimile Multiplex Broadcasting Technology

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pp 1-30

### Introduction

[Text] Facsimile-multiplexed broadcasting is a new broadcasting medium, in which the transmitter transmits character, figure, photo, etc. information by superimposing it on TV broadcast signals, and the receiver can print out the information in the form of a hard copy. It is expected to respond to a variety of information needs with its new characteristics as a medium.

Following the development of related technologies, a report on the technical conditions for facsimile-multiplexed broadcasting superimposed on TV broadcasting signals (hereafter abbreviated as "fax multiplex broadcasting") was issued in February 1989 by the Telecommunications Technology Council.

In May 1989, the Facsimile Broadcasting Technology Research Group, which is a study/research organ of the Director of the Engineering Division, Broadcast Administration Bureau, Ministry of Posts and Telecommunications, issued a report on the applicable fields and desirable applications. As seen from these reports, fax multiplex broadcasting is entering the practical stage from the viewpoint of technology.

Under this situation, the Fax Multiplex Broadcasting Study Group was established as a study/research organ by the Director General of the Broadcast Administration

Bureau of the MPT in order to contribute to the arrangement of the required system through examinations of desirable systems related to fax multiplex broadcasting from many different aspects. Since the first meeting held on 22 November 1989, the committee continued its examinations of such topics as: 1) how the business operation should be; 2) how the program discipline should be; 3) how the source of capital should be; 4) how the licensing system should be, and has compiled results which are described in this report.

### Chapter 1. Summary of Fax Multiplex Broadcasting

#### 1. What Is Fax Multiplex Broadcasting?

Fax multiplex broadcasting is a new broadcast medium, which superimposes still-image information such as characters and figures or photographs with gradations, etc., in the form of digital signals in spaces in broadcast TV signals. This allows programming consisting of characters, figures, and photos to be broadcast simultaneously with TV programs; the receiver can print the characters and photos on paper using a fax terminal, or can reproduce them on a high-definition display installed separately from the TV receiver. With the possibility of recording and storage as well as the features of broadcast signals, such as simultaneous distribution, quick distribution and wide target areas, this medium is expected to respond to a wide range of needs of households and businesses for information (Figure 1).

#### 2. Features of Fax Multiplex Broadcasting

(1) The fax multiplex signal has the following features.

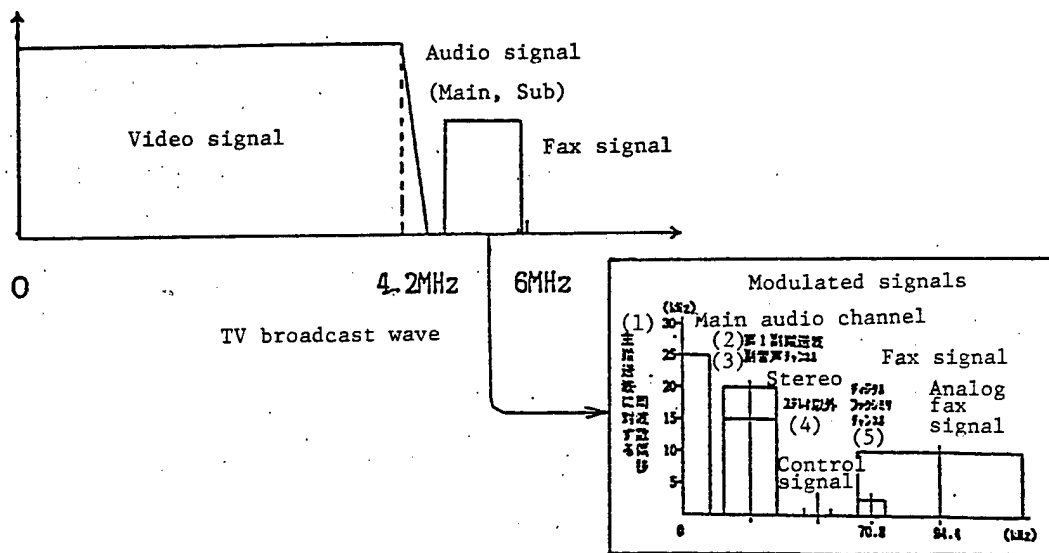


Figure 1. Transmission of Fax Signal

Key: 1. Frequency deviation with respect to main carrier 2. First subcarrier 3. Sub audio channel 4. Other than stereo 5. Digital fax signal

1) The fax multiplex broadcast transmitter/receiver complies with CCITT Recommendation T.4 (see Note below), to match the cabled G3 fax standard.

2) A4 size images corresponding to the fine mode of G3 fax can be transmitted/received.

3) About 4,000 characters of information can be accommodated on an A4 size sheet, providing a high visual effect for a broadcast medium.

Assuming that the average transmission time of an A4 sheet is 2 minutes 30 seconds and that broadcasting 24 hours a day is possible, the daily transmission capacity will be 576 pages (corresponding to both the morning and evening editions of four papers, when converted into pages of Japanese newspapers).

4) Conformity with the data channels of satellite broadcasting can be assured in the future. In addition, it is also thought that the software copy's compatibility with the display method will make its features more advanced and diverse.

(Note) "CCITT Recommendation T.4" is a recommendation issued by the CCITT (International Telegraph and Telephone Consultative Committee), which is a standing organ of the ITU (International Telecommunications Union), whose duty is to conduct research into problems related to telecommunications technology, operations and tariffs. Recommendation T.4 specifies the main standards related to G3 facsimile equipment.

(2) When compared with other main broadcasting media (TV broadcasting, radio broadcasting, character multiplex TV broadcasting), its characteristics as a medium are as follows.

A. Characteristics when compared with TV broadcasting and radio broadcasting

(a) Since fax multiplex broadcasting is superimposed on broadcast TV signals, the service carrier should arrange to utilize the broadcasting facilities of a TV broadcast carrier.

(b) As only one fax multiplex broadcast can be superimposed on each terrestrial TV broadcasting channel for the present, the number of fax multiplex channels that can be provided in an area is equal to the number of TV broadcasting channels in that area.

(c) With fax multiplex broadcasting, the form of information transmitted is basically character-type information such as characters, figures and photos. The information transmitted by TV broadcasting includes video and audio information, and radio broadcasting transmits audio information such as voice.

As a result, in general, TV broadcasting and radio broadcasting feature a richer range of expression, superior cultural creativity and larger amounts of information, as well as easier understanding and deeper audience penetration.

(d) Since its start in 1953, TV broadcasting in Japan has grown rapidly. Today, TV broadcasting has assumed an important social function as a key information provision medium, indispensable for national life, with a total of four NHK broadcasting networks including two terrestrial channels and two satellite channels receivable in all parts of the nation, and about 80 percent of Japanese households capable of receiving four or more additional channels provided by general carriers. The functions of TV broadcasting are continuing to become more diverse and substantial, as seen with the start of satellite broadcasting by a general carrier after the launch of BS-3 in August 1990, the start of EDTV broadcasting, and development of HDTV.

Radio broadcasting has also spread throughout the nation and permeated into the national life thanks to easy reception anywhere and anytime using compact and simple receivers. Today, two AM networks and one FM network can be received from NHK. As for broadcasting by general carriers, two or more AM stations can be received in major areas while at least one can be received in all other areas, about 80 percent of Japanese households can receive at least one FM station, and one SW station can be received throughout the nation. It is expected that the development and implementation of PCM audio broadcasting will bring further diversification to the functions of radio broadcasting.

It is in this context that fax multiplex broadcasting will be implemented in the future, and its image is unavoidably vague compared to TV and radio because it is a medium based on characters, etc. As a result, similar to the cases of videotex and character-multiplexed television broadcasting (hereafter simplified to "character multiplex broadcasting"), it seems that businesses will have to make great efforts and spend much time before the usefulness of fax multiplex broadcasting based on its excellent characteristics as a medium, such as the possibilities of recording and storage and high visual effect of character information, is recognized by the public and its popularity grows.

(e) As for the limited availability and scarcity of TV frequencies as discussed in point (b) above, fax multiplex broadcasting can be recognized as having the same limits as terrestrial TV broadcasting. However, from points (c) and (d) above, although its social influence in the future is expected to grow through growing popularity and the exhibition of its effects, it is thought that its social and cultural influence for the present is fairly limited compared to TV and radio broadcasting and its power as a medium is weak. Therefore, its commercialization is regarded as not very easy just like videotex and character multiplex broadcasting which are also based on character information.

As for fax multiplex broadcasting superimposed on satellite TV signals (hereafter called "satellite fax multiplex broadcasting"), its characteristics need to be examined

separately, for this method can cover the whole nation with only one wave and can provide a much larger amount of information.

B. Medium characteristics compared to character multiplex broadcasting (Table 1)

**Table 1. Comparison of the Characteristics, etc., of Fax Multiplex Broadcasting and Character Multiplex TV Broadcasting as Media**

Item	Fax multiplex broadcasting	Character multiplex TV broadcasting
Stage of Contact With Information at Receiver		
Main display method	Paper hard copy (Digital "soft" copy also possible)	CRT (Hard copy also possible)
Receiving mode	Standby reception	Real-time reception
Displayed information contents	Characters, figures, image information with gradations such as photos	Characters and figures only (Additional tone)
Display characters	2,000 to 4,000	120 (Level A), 480 (Level B)
Compatibility with TV viewing	Another TV program can be viewed during reception of fax multiplex broadcasting.	During reception of character multiplex broadcasting, the TV program itself cannot be viewed except when characters are superimposed on it.
Number of programs that can be selected at a time	1 (More than one fax multiplex broadcast cannot be received simultaneously.)	Several (Several character multiplex broadcasts can be selected by search or channel switching.)
Stage of Transmission, etc.		
Transmission system	A4 image is broken down into dots, and transmitted in the form of a "picture."	Characters, figures, etc., are transmitted in the form of codes.
Multiplexing system	Frequency multiplexing (Subcarrier is provided outside audio signal band and signal is multiplexed there.)	Time-domain multiplex (Signal is multiplexed on the part of H scanning line corresponding to outside the screen.)
Other		
Color display	Impossible at the present (Possible with analog system)	Possible
Freedom of graphic display	Large (Fine graphics display is possible)	Small (Limited to simple graphics display)

The following shows the results of a comparison between the characteristics as a medium of fax multiplex broadcasting with those of character multiplex broadcasting, which is a typical terrestrial medium permitted to be operated in "independent use" among multiplex broadcasting technologies and is at the practical stage at present.

(a) Although the superimposition and transmission methods may be different, both have the common feature that information is transmitted superimposed in spaces in TV broadcast signals, therefore the broadcasting facilities of the carriers of the TV signal on which it is superimposed must be borrowed.

(b) With a terrestrial TV broadcasting channel, character multiplex broadcasting can superimpose several programs while the fax multiplex broadcasting can superimpose only one.

(c) A common feature is that the contents of information transmitted are mainly characters and figures, but fax multiplex broadcasting can also transmit still image information with gradations, such as photos.

(d) The amounts of information transmitted cannot be compared directly, as the number of characters displayed

per page is greater with fax multiplex broadcasting but the number of programs transmitted simultaneously and the transmission rate per page are higher with character multiplex broadcasting.

(e) As for receiving modes, there are the following differences apart from technical systems.

1) While fax multiplex broadcasting allows the reception of information at the same time as viewing a TV program, character multiplex broadcasting is not suitable for simultaneous TV viewing except when the characters are to be superimposed on the TV picture.

2) The reception system of fax multiplex broadcasting consists mainly of a paper hard-copy and also allows a software copy if suitable equipment is added. The reception system of character multiplex broadcasting consists basically of a TV screen display, with a hard copy available if equipment is added.

3) Fax multiplex broadcast can be received in the absence of the operator by presetting the desired programs, but the reception of character multiplex broadcasting must be in real time.

### 3. Present State of Technical Developments of Fax Multiplex Broadcasting Technology

#### (1) Present Situation

The examination on the fax multiplex broadcasting technology was started in 1972 by the Radio Wave Technology Council (reorganized in 1985 as the present Telecommunications Technology Council), and a consultative report "Technical Conditions of Facsimile Broadcasting" was issued by the Telecommunications Technology Council in February 1989.

At present, the Broadcast Technology Development Association (BTA) is conducting examinations on the system for charging for fax multiplex broadcasting. The Telecommunications Technology Council will also start investigations based on the results of the BTA examinations.

#### (2) Topics To Be Examined in Future

##### A. Satellite fax multiplex broadcasting

Since December 1983, NHK has performed experiments related to fax multiplex broadcasting using the data channel of satellite BS-2b.

In future, these experiments are scheduled to be developed as part of overall studies into the use of the data channel part of satellite TV broadcasts.

Satellite fax broadcasting receivers will be partially compatible with terrestrial fax broadcasting receivers.

##### B. Other (future technical examination topics)

##### (a) Color transmission

The Telecommunications Technology Council has reported on an analog color transmission system. However, as this system causes interference with some current TV multiplex broadcasting receivers, the examination of countermeasures is required in the future.

Also, this is a point needing technical examination for the simultaneous use of the digital system recommended by this report and the analog system, and this requires further study.

##### (b) Fax multiplex broadcasting complying with the G4 standard

The current fax multiplex broadcasting standard conforms to the G3 cable facsimile standard. Considering the future developments of the G4 fax system with such excellent features as six times the information transmission capacity of G3, transmission of higher-resolution images and compatibility with mixed-mode communication functions (such as reception via a personal computer), it is necessary to examine a standard which will comply with the G4 standard.

### 4. Examples of Fax Multiplex Broadcasting Services

A variety of information provision services can be provided through fax multiplex broadcasting. As implementation advances, it is thought that progress and diversification will take place thanks to the inventiveness of information providers and broadcast carriers and in response to user needs. For the present stage, the services shown in Table 2 are expected to be provided.

### Chapter 2. How Fax Multiplex Broadcasting System Should Be Organized

Based on the principles of assuring that broadcasts are able to be received by the maximum number of people and that they are effective, securing freedom of expression in broadcasting and supporting broadcasting that contributes to the healthy development of democracy, Japanese legislation has established disciplines for the healthy development of broadcasting, covering broadcasting business operators, broadcast programs, management capital, etc., as shown in "Reference Material."

The foundation of these disciplines is based on the limited availability/scarcity and social influences of radio frequencies. However, these are different due to the different characteristics of each broadcasting medium, for example the frequencies used, the forms of information provided, the amounts of information and technical conditions. To allow healthy and smooth diffusion and growth, the display of the full effects of various new broadcast-related media being developed and put to practical use following the diversification and development of information needs and rapid progress of technical developments in recent years, it is indispensable to establish the optimum system according to the characteristics of each medium.

From the basic standpoints described above, the Study Group proposes a system for the organization of fax multiplex broadcasting, according to the characteristics of fax multiplex broadcasting as a medium.

#### 1. How Central Discipline Should Be

##### (1) Principle of Elimination of Mass-Medium Concentration

The principle of the elimination of mass-medium concentration aims at opening the limited and scarce radio frequencies to as many people as possible, and at securing the formation and growth of a free speech/press market as an institution by allowing the participation of as many general carriers who use these frequencies for broadcasting as possible as independent speech/press organs. Up to now, this principle has been applied uniformly to all broadcasting media.

However, following the development and implementation of new broadcasting media having different characteristics in terms of operable frequencies, social functions, influences, power as media, commercialization possibilities, etc., from TV and radio broadcasting, what

Table 2. Examples of Fax Multiplex Broadcasting Services

	Examples of possible IPs	Examples of information contents
<b>Complementary-type use</b>		
Complementing TV broadcasts (including character multiplex broadcasting)	(TV stations) (Character multiplex TV broadcast stations)	Detailed explanation of contents of and terms used in TV news program, program news (PR news-letter), scores and lyrics of music, recipes of cooking program, text of educational program, complementary information of commercial, station notices, meteorological information, etc. As complement for character multiplex broadcasting: program table, detailed explanations of news, sports and traffic information, stock and merchandise market information, detailed explanation of character broadcast screen, program guide in English, etc.
<b>Independent uses</b>		
Complement of existing media	Newspapers, magazines, publications	Complementary information for newspaper, magazine, publications, etc.
	AM/FM radio stations	Program table, etc., of AM and FM radio broadcasts
General use	Providers of information related to the right	News, weather forecast, business news, stock, market, financial information, new product and technology information, job and employment information, government/private office personnel information, real estate and housing information, event and travel information, horse racing information, PR, traffic information, university pass list, goods sale and bargain guide (with coupons, etc.), golf course guide, town guide, lottery winning numbers, other information related to economy, life, hobby and entertainment, various information for foreigners.
Specialized use		Services for each specialized field or area related to information listed above.
	Economic information company, etc.	Paid economical information, etc.
Use according to business types and forms	Professional groups such as scientific societies	Academic information, guide to new publications, etc.
	Educational organizations such as schools	Correspondence education course of preparatory schools and private schools, simultaneous examinations at national or regional level and announcement of results.
	Organizations related to physical distribution, etc.	Information and prompt reports on fresh foods, etc., various market information
	Other	Other specialized information.

is required for the smooth diffusion and development of these new media is to establish a system in which various management know-how and inventiveness can be demonstrated through assigned domestic broadcasting, temporary broadcasting for a specific purpose, and even the participation of existing carriers of already-commercialized multiplex broadcasting businesses.

Therefore, based on a general consideration of the above requirements and the estimation that resultant ill-effects will be very small, the present system makes an exception not to apply the principle above for suitable media.

As described in section 2-(2) of Chapter 1, the limited availability/scarcity of usable radio frequencies for fax

multiplex broadcasting is for the present identical to that of terrestrial TV broadcasting, its social influence is much less than TV and radio broadcasting considering the forms of information provided, the amount of information and estimated diffusion of receivers, and its social functions may not be as indispensable as TV broadcasting. Thus, it is thought that its power as a medium is weak and its commercialization will not be easy in today's media environment.

Due to such characteristics of fax multiplex broadcasting as a medium, there is a need to establish a system in which various factors of management know-how and inventiveness can be demonstrated as much and as easily as possible by accommodating the participation of existing general broadcast carriers so that the fax multiplex broadcasting can be commercialized, popularized and developed smoothly and that the results of technical developments can be returned to the people as soon as possible.

While the principle of the elimination of mass-medium concentration will not be applied to fax multiplex broadcasting, the ill-effects of this are estimated to be small, taking into account the fact that the same principle is applied to the TV frequencies on which they will be superimposed, the degree of social influence of fax multiplexing broadcasting, the progress of medium diversification following the future diffusion and development of media such as satellite broadcasting and CATV.

Therefore, based on overall consideration of the above, the authors believe that it is best not to apply the principle of elimination of mass-medium concentration to fax multiplex broadcasting as an exception.

Even in this case, however, it is still necessary to examine the promotion of new participants in accordance with the fundamental idea of the principle of the elimination of mass-medium concentration, as it is not desirable to cause extremely concentrated conditions, such as the ownership and control of several fax multiple broadcasting channels in one area by the same operator.

## (2) How NHK Should Be Involved

### A. Fax multiplex broadcasting by NHK

Broadcasting in Japan has developed steadily with the coexistence of public and private broadcasting companies. In this system, NHK has contributed much to the development of Japanese broadcasting through promoting the nationwide diffusion of broadcasting as a public broadcasting organization and has played a leading role in the development and implementation of new services.

However, after around 1975 when the ownership of TV receivers became saturated, NHK started to face severe financial conditions. Also, NHK now has a domestic broadcasting system with two AM radio networks, one FM network, four TV networks (two terrestrial channels,

two satellite channels), three audio multiplex TV broadcasting channels (one terrestrial channel, two satellite channels) and one character multiplex broadcasting channel as well as an international broadcasting network, and the need to check and re-examine the way NHK owns media as a public broadcasting corporation have been pointed out by many persons and related companies. Now that commercial broadcasts have developed considerably and various new broadcasting media are being developed and put to practical use, the status of NHK, as a public corporation, is being questioned again.

Therefore, whether NHK should carry fax multiplex broadcasts or not needs to be examined based on the consideration of the following:

- 1) The role of public broadcasting with the coexisting structure of public and commercial broadcasts;
- 2) The optimum scale as a press organization;
- 3) The financial circumstances of NHK.

However, at least in regard to the "independent use" of fax multiplex broadcasting, it is not a key medium in which NHK should be involved in the future considering its functions as a medium for the provision of information, compared to TV broadcasting and radio broadcasting which have become popularized and developed as key media indispensable for national life, and the authors do not believe that it is suitable for NHK to deal with its independent use considering its severe financial conditions and the elimination of excessive medium concentration.

In regard to "complementary use" to enrich the contents and effects of TV broadcast programs, the authors believe that it should be judged by a separate re-examination of all of the media controlled by NHK, and also based on points 1) to 3) above.

### B. Fax multiplex broadcasting by a third-party enterprise by superimposing signals on NHK TV signals

For the effective utilization of radio frequency resources as well as NHK facilities, the authors believe that it is preferable for a third-party enterprise to transmit fax multiplex broadcasting by superimposing signals on NHK TV signals.

Even with fax multiplex broadcasting by a third-party enterprise, as it will accompany the use of NHK broadcasting facilities which are based on viewing fees, it is desirable that it pay attention to the character, mission and image of NHK as a public broadcasting corporation.

## (3) Desirable Broadcasting Target Areas

The broadcast target area refers to the specific area which is recognized as being able to receive broadcasting of a specific program from a broadcasting station assigned to that area. It is determined by the "Basic Project for Diffusion of Broadcasting" in consideration of frequencies that can be assigned for broadcasting,



trends of technical development and demands of broadcasting, and natural, economical, social and cultural circumstances of each area (Article 2-2 of Japanese Broadcast Law).

As fax multiplex broadcasts are superimposed in spaces in broadcast TV signals, the coverage area is identical to the terrestrial TV broadcast on which it is superimposed unless special measures are taken. Technically, however, it is also possible to set a different target area from that of TV broadcasting.

Meanwhile, considering the demand for broadcasting and natural, economical, social and cultural circumstances of different areas lead to the following conclusions:

a. The current target areas of terrestrial TV broadcasting have been established for many years as areas which are recognized to be adequate of the reception of specific broadcast programs;

b. Even if there are needs for information from wider local areas than the current broadcasting target areas, such needs can be dealt with because a single carrier can provide fax multiplex broadcast signals to several current broadcast target areas by forming a network or by not applying the principle of elimination of mass-medium concentration for fax multiplex broadcasting as discussed in (1) above;

c. It is not suitable to set smaller target areas than the current broadcasting target areas, because of the problems of cost and economical capability for small areas which would become the basis of fax multiplex broadcasting, considering its powers as a medium and commercialization possibilities.

Based on the above, the authors believe that it is preferable to set the broadcasting target areas of fax multiplex broadcasting of general carriers basically to be "identical to the broadcasting target areas of the TV broadcasts on which they will be superimposed."

However, in case a general carrier wants to carry out fax multiplex broadcasting superimposed on an NHK educational TV broadcast (the broadcasting target area of which is nationwide), it would be desirable to set its broadcasting target area in consideration of the future demands in broadcasting, business trends of other fax multiplex broadcasting carriers, etc.

With NHK, even when fax multiplex broadcasts are transmitted, their usage should be limited to complementary use for the superimposed TV broadcasting as discussed in (2)-A above. The authors therefore believe that their broadcasting target areas should be set to be "identical to the broadcasting target areas of the TV broadcasts on which they are to be superimposed."

## 2. How Program Discipline Should Be

### (1) Program Criteria

Program Criteria are legislative provisions with the following items as minimum standards which should be observed when a carrier edits and broadcasts a broadcast program. According to the present broadcast law, these criteria are applied uniformly to all broadcast media (Article 3-2, Clause 1 of Japanese Broadcast Law).

1) [The broadcasting] shall not injure the public safety and good manners.

2) Shall be politically impartial.

3) The information shall not deviate from the truth.

4) With problems involving opposing opinions, the issue shall be clarified from as many angles as possible.

Among these, the "maintenance of public safety and good manners" and "securing of the truth of information" are widely accepted by society as the natural social duty of anyone concerned in broadcasting, and the authors believe that it is suitable to also apply them to fax multiplex broadcasting, as minimum criteria to be observed.

As for "securing political impartiality" and "clarification of issues from many angles," some people have pointed out the need to examine whether these criteria should be made legal requirements for all broadcast media today when broadcast media have diversified and increased with the participation of many carriers.

However, this problem requires examination and discussions from many different angles on such issues as: to what degree people with different opinions can have occasion to broadcast their opinions under today's broadcast media organizational situation; and from the viewpoints of the assurance of the formation and growth of free and multi-viewpoint speech/press market and healthy development of democracy, how opinions on topical problems, including political problems, should be provided to people through all broadcast media to comply with public welfare. It is difficult to draw conclusions on this problem from the examination of fax multiplex broadcasting alone. Even if we limit our discussions only to fax multiplex broadcasting, the judgment will not be easy because, since there is only one usable frequency per terrestrial TV broadcasting channel, to how many people broadcasting can be opened and if freedom of expression can really be enjoyed by many people cannot be known, without observing actual usage in the future.

In consequence, the authors believe that it is suitable to also apply the criteria of "securing political impartiality" and "clarification of issues from many angles" in the implementation of fax multiplex broadcasting, and to continue study from many different angles on how fax multiplex broadcasting should be organized as a problem common to all broadcast media, based on progress in the

diversification of broadcast media and the actual situation of fax multiplex broadcasting.

## (2) Principle of Harmony

The Principle of Harmony used to be applied uniformly to all broadcast media. However, now that broadcast media have increased and diversified, it has become almost unnecessary to require harmony between programs in all media other than key media, and it is desirable that broadcast media which are not key broadcast media provide programs according to their individual characteristics rather than considering harmony between programs so that broadcasting can respond to the various expectations of people in the age of diversification and specialization of information needs. In consequence, the amendment of the Broadcast Law in 1988 decided to apply this principle only to key broadcast media, that is, TV broadcasting and NHK radio broadcasting.

When fax multiplex broadcasting is examined from this viewpoint, it does not have characteristics as a medium that make it a key medium which is as important as TV broadcasting, and the results of hearings we conducted and various other investigations show that many people think that it is a medium suitable for providing specialized information. To meet the various needs of different people, it seems to be more desirable to allow the medium to provide programs utilizing its individual characteristics without being restricted by the principle of harmony.

In conclusion, the authors believe that it is preferable to exempt fax multiplex broadcasting from the Principle of Harmony.

## (3) Obligation To Form Program Deliberation Committees

Program deliberation committees are important institutions for ensuring the freedom of broadcasting and the autonomous optimization and improvement of broadcast programs, and their establishment by each broadcast carrier is provided by law. As institutions reflecting the opinions of representatives of the audience, they are expected to play an important role for the autonomous optimization and improvement of programs by broadcast carriers through their activities, enriching their own functions, etc.

However, under present conditions in which broadcast media are diversified in several aspects—including the forms in which information is provided and the contents of the information—the roles expected of program deliberation committees and how they should be organized vary depending on the characteristics of different media. Therefore, it may not always be suitable to apply the provisions for TV broadcasting and other key media uniformly to all broadcast media.

To optimize the discipline based on the above, the Broadcast Law was amended in 1988 to include provisions for the formation of program deliberation committees, and to exempt specialized carriers who broadcast only programs which do not involve the fields covered by program deliberation committees and the importance of which lies in the correctness of information, such as economic market information and natural phenomena (weather forecasts, etc.), and carriers which only transmit special and temporary broadcast programs, from the obligation of establishing program deliberation committees.

For carriers which are mainly specialized in multiplex broadcasting which involves the actions covered by the program deliberation committees but the field is not so large as broadcast TV due to the mode of information transmission, the amount of information and the information contents, such as character multiplex broadcasting carriers, the number of members of program deliberation committees was reduced from "seven or more" to "five or more."

The question of how many fax multiplex broadcasting activities the program deliberation committees can carry out must be studied based on its characteristics as a medium. The following can be identified in regard to this question.

1) When compared with TV and radio broadcasting, fax multiplex broadcasting does not have the same power of expression and cultural content, and the amount and contents of information provided are also limited. Therefore, the activities by the program deliberations committees are not carried out as much as other media.

2) When compared with character multiplex broadcasting, fax multiplex broadcasting can transmit photos with gradations and offer a high visual effect. However, character multiplex broadcasting is capable of color transmission and transmitting more programs simultaneously, and is superior in the promptness of information and ability to simultaneously complement the TV broadcasting. Therefore, it is not simple to determine which of these media has a wider field in which the actions expected from program deliberation committees is more applicable.

From the above, in regard to the application of the program deliberation committee provision to fax multiplex broadcasting, the authors believe that it is suitable to exempt fax multiplex broadcasting carriers whose broadcast contents are limited only to economic market information, natural phenomena, etc., from the obligation of establishing program deliberation committees like the carriers of specialized broadcasts of other broadcast media. For carriers who are not specialized carriers but are devoted to fax multiplex broadcasting, the authors believe that it is suitable to apply the same measure as for character multiplex broadcasting, that is,

to make it an obligation to establish a program deliberation committee but reduce the number of the committee members from "seven or more" to "five or more."

If, in the future, the actual functions or roles expected of program deliberation committees should change according to the services provided by fax multiplex broadcasting, the authors believe that it is suitable to examine how and why this provision should be changed, as needs arise.

#### **(4) Obligation To Set Program Standards**

The obligation to set program standards is a provision for their autonomous optimization and improvement of programs by broadcast carriers, similar to the obligation to establish program deliberation committees.

Namely, the establishment and amendment of program standards are to be settled in consultation with the program deliberation committee, and their observance and publication are defined. These will help reflect the opinions of men of learning who form program deliberation committees as representatives of the local audience, as well as those of the audience through a closer relationship between the carriers and their general audience. The observance of program standards is expected to allow the broadcast carriers to optimize and improve their broadcast programs autonomously.

This obligation is not applied to certain specialized carriers and carriers who only transmit special and temporary broadcast programs, who are exempt from the obligation to establish program deliberation committees.

Based on the above, it is suitable to apply this provision to fax multiplex broadcasting for almost the same reason as the need to establish program deliberation committees.

Similarly to the case of the obligation to establish program deliberation committees, the authors believe that it is suitable to examine how and why this provision should be implemented, as need arises in future based on the situation of services provided by fax multiplex broadcasts.

#### **(5) Modes of Utilization**

The modes of utilization of multiplex broadcasting can be divided into independent use, to provide completely independent programs from the TV broadcasts on which they are superimposed, and complementary use for supporting the TV broadcasts on which they are superimposed (among complementary uses, we call use to simultaneously complement the TV broadcast on which it is superimposed "purely-complementary use").

In present legislation, carriers who operate both multiplex TV broadcasting and TV broadcasting are obligated to make efforts to broadcast programs which simultaneously complement the TV program being broadcast (bilingual broadcasting, stereo broadcasting, telops, etc.)

in consideration of the social mission of broadcasting and the high utility of complementary use of TV multiplex broadcasting to achieve this mission. At present, TV carriers operating existing audio multiplex TV broadcasting or character multiplex TV broadcasting are broadcasting programs under this provision.

In consequence, what the modes of utilization should be is one of the topics to be examined, including whether or not it is proper to impose an obligation to make efforts for purely-complementary use on TV carriers operating fax multiplex broadcasting. The following applies to the examination of fax multiplex broadcasting.

(a) It may not be suitable to limit uses only to complementary use, because this will exclude the possibility of demonstrating the utility of independent use as discussed in Chapter 1, section 4, and that the characteristics as a medium do not present the necessity of taking the same measure as for audio multiplex TV broadcasting.

The results of a hearing by the Study Group show that many people imagine that services will consist "mainly of independent use." It is not suitable to exclude the possibility of independent use also from the viewpoint of smooth diffusion of fax multiplex broadcasting.

(b) On the other hand, with regard to complementary use, it has certain utility as seen from detailed explanations of the contents of and terms used in TV news programs, instant provision of text for educational programs, etc., and it is not logical nor suitable to exclude such uses.

(c) As for the provision of the obligation of making efforts for purely-complementary use:

a. Only one program can be transmitted per TV channel; and

b. It is not easy to find a purely-complementary use with high utility deserving the obligation of making efforts, such as bilingual, stereo and character multiplex broadcasting of TV, with fax multiplex broadcasting.

Therefore, to contribute to the diffusion and development of fax multiplex broadcasting and respond to people's expectations, it is better to exempt carriers from this obligation but to allow them to show their inventiveness to the maximum and provide various programs according to various information needs.

Based on the above, the authors believe that it is suitable to exempt fax multiplex broadcasting carriers from the obligation of making efforts for purely-complementary use, and to entrust the degree of complementary and independent use to the judgments of the carriers themselves.

Even in this case, it is desirable that TV carriers who also transmit fax multiplex broadcasts sufficiently consider complementary use in accordance with the social mission of their broadcasting business, such as the previous

provision of the plots of dramas of their TV programs and provision of detailed contents of news they broadcast.

### 3. How Sources of Business Capital Should Be

The sources of business capital of general carriers used to be based mainly on advertising revenues. However, the amendment of the Broadcast Law in 1988 arranged for pay-per-view broadcasting so the whole of the commercial broadcasting industry could acquire sufficient funding to deal with advances in multiple media in the future.

At present, pay-per-view broadcasting is scheduled only for satellite broadcasts (TV broadcasts, audio multiplex TV broadcasts, character multiplex TV broadcasts). As terrestrial broadcasts have been accepted by people as a key medium which contributes to public welfare and for which the audience does not have to bear expenses for viewing, the introduction of a pay-per-view system for them was delayed for the reason that sufficiently cautious examinations are required as to its necessity and applicability.

However, as for fax multiplex broadcasting, the following applies.

a. It is a suitable medium for providing specialized information. To make full use of its characteristics as a medium, it is suitable to introduce a pay system which can be expected to reflect the needs of the audience more directly in program production and which has the possibility of dealing with the specialized needs of the audience in a better way.

b. Since its power as a medium is weak and its commercialization will not be easy, it is better to diversify the options of business capital sources by allowing pay systems as well as broadcasting advertising so that the inventiveness of carriers can be exhibited to the maximum in establishing their business foundations for the smooth diffusion and development of fax multiplex broadcasting.

c. Its characteristics as a medium do not make it a key medium in national life to the same extent as terrestrial TV broadcasting and radio broadcasting.

d. The results of a hearing by the Study Group showed that there are many requests related to the introduction of pay broadcast systems.

Based on the overall consideration of the above, the authors believe that it is suitable to introduce a pay system from the very start of implementation in order to popularize and develop fax multiplex broadcasting smoothly and respond to people's various needs and, for the degree of broadcasting advertising and pay systems as sources of business capital, to entrust it to the general carriers themselves.

Also, according to the actual situation of its operation, it is also desirable to conduct, as required, studies on how

pay broadcasting systems should be arranged to match its characteristics as a medium.

On the other hand, with regard to NHK, even if it started fax multiplex broadcasting, its utilization should be limited basically to complementary uses which are designed to enrich the contents of the TV program on which it is superimposed or to enhance its effect as described in (2)-A before. Therefore, considering the basic character of NHK, it is unnecessary to discuss the introduction of new funding, but such broadcasting should be done within the framework of the present viewing fee system.

### 4. How Licensing System Should Be

Current legislation defines that broadcast carriers who are able to transmit terrestrial broadcasts including multiplex broadcasts are "those who are licensed as broadcasting stations according to the provision of the Radio Law," and a licensing system based on the principle of not discriminating between broadcasting facilities and program content is applied uniformly.

On the other hand, as for satellite broadcasts, the amendment of the Broadcast Law in June 1989 introduced a licensing system separating broadcasting facilities and program content (assignment system) so that, in fields such as broadcasting services using communications satellites where it is desirable that those who want to provide broadcasting services can easily conduct their business by participating in broadcasting without assuming responsibility for the broadcasting facilities, the licensed operator of radio stations (contract broadcast business operator) and the editor of broadcast programs (commissioned broadcast business operator) are independent.

Some aspects of the nature of fax multiplex broadcasting indicate that a licensing system separating broadcasting facilities and program content (assignment system) may be more suitable because it is performed by leasing the facilities of the carrier of the TV broadcast on which fax multiple broadcasts are superimposed, but consideration on the following conditions is also necessary.

a. Both character multiplex broadcasting and FM multiplex broadcasting, which are similar to fax multiplex broadcasting, are being administered under a licensing system which does not discriminate between broadcasting facilities and program content, and no ill effects have been found with this arrangement.

b. The results of a hearing held by the Study Group showed there were requests for a simplification of the licensing system, but there was no request for the separation of broadcasting facilities and program production.

Therefore, it may be suitable to use a licensing system that does not discriminate between broadcasting facilities and program content similar to the third-party use of

present character multiplex broadcasting, while also taking the requests for the simplification of the licensing system into consideration.

Even in this case, it is still desirable to continue, as required, examinations on the introduction of a licensing system that separates broadcasting facilities and program production based on the actual situation of operation, needs, etc.

The examination until now has presupposed the presence of one carrier per usable TV channel. But it may also be possible to introduce time-sharing to ensure broadcasting with impartiality for as many people as possible.

However, this involves many problems which deal with the very basis of the way broadcasting business should be arranged, for example: how to divide the use of one frequency; if broadcast services can be provided stably; how to ensure capabilities as a broadcast carrier. It is therefore desirable to conduct sufficiently cautious studies considering the trend of future developments of business associated with fax multiplex broadcasting, etc.

## 5. Other Points

The Study Group believes that it is suitable to develop required preparations for fax multiplex broadcasting so that it can be put to practical use in a year considering the establishment of technical standards and production of receivers, etc., and that it is necessary to establish a support system for its implementation as soon as possible (by establishing a marketing promotion council, for example).

## Reference Material

### Present Situation of Major Topics Examined

#### 1. Central Discipline

##### (1) Principle of Elimination of Mass-Medium Concentration

According to Chapter 1, section 2 of the "Basic Project for Popular Broadcasting, which is based on Article 2-2 of the Broadcast Law (hereafter referred to as "the Law"), the principle of elimination of mass-medium concentration is defined as described below, as a guideline for allowing as many people as possible to enjoy the freedom of expression through broadcasting by securing occasions of broadcasting for as many people as possible.

1) For broadcasting by general carriers, the number of broadcasting systems owned or dominated by one party shall be in principle limited so that broadcasting is opened to as many people as possible.

2) In principle, the concentration of the ownership or domination of means of various information provision to the general public in an area to a specific party through the establishment of broadcasting stations shall be avoided.

In addition, Article 9 of "Fundamentals for Establishment of Broadcasting Stations" which is the broadcasting station licensing standard based on the Radio Law embodies the following principle.

##### • Prohibition of Domination of Several Broadcasting Stations

The number of broadcasting stations which can be subject to the ownership or management domination (Note 1) of one party is limited to one.

##### (Exceptions)

(1) In case of the ownership or management domination of an AM radio station and TV broadcasting station in the same broadcasting target area.

(2) In case of the establishment of relay stations in the same broadcasting target area.

(3) In case assigned domestic broadcasting, multiplex broadcasting (Note 2), or broadcasting for temporary objectives (including assigning broadcasting) is transmitted mainly.

(4) In case special necessity for diffusion of broadcasting, etc., is recognized.

##### • Prohibition of Domination of Three Lines of Business

A party shall not start a broadcasting business if this would lead to the simultaneous management or management domination (Note 1) of AM radio broadcasting, TV broadcasting and newspaper businesses.

##### (Exception)

If there are other carriers who provide information, such as general broadcast carriers, newspaper companies and news agencies, in the broadcasting target area, and in case the opening of the new station does not cause the danger of monopolistic information provision by the party opening the station.

##### • Application in Assigned Broadcasting Business

With assigned broadcasting businesses legislated in 1989, decision in accordance with the Broadcast Law will be made with almost the same measures.

(Note 1): Management domination refers to the following cases.

1) When one party possesses one-tenth or more of the total votes.

2) When the directors of a corporation or group occupy one-fifth or more of the directors of another corporation or group (excluding an auditor).

3) When a representative director or a full-time director of a corporation or group assumes the post of a director of another corporation or group (excluding an auditor).

(Note 2): With audio multiplex broadcasting of satellite TV, refers only to the programs the contents of which are related to the contents of the TV program being broadcast simultaneously or to disasters.

## **(2) Services Provided by NHK**

The services provided by NHK are defined in Article 9 of the Law. As its basic operations, NHK provides AM radio, FM radio, TV and multiplexed broadcasting (character multiplex FM broadcasting, audio multiplex TV broadcasting, character multiplex TV broadcasting) services as domestic broadcasts. In addition, it also conducts studies and research required for progress and development of broadcasting and reception, and provides international broadcasting.

The broadcasting target areas and the target number of broadcasting channels are defined in the Basic Project for Popular Broadcasting.

## **(3) Broadcasting Target Areas**

The broadcasting target areas are defined in the Basic Project for Popular Broadcasting which is based on Article 2-2 of the Law. The broadcasting target areas defined for TV broadcasting are: nationwide, Kanto wide area (district including Ibaraki-ken, Tochigi-ken, Gunma-ken, Chiba-ken, Tokyo-to and Kanagawa-ken); Chukyo wide area (district including Gifu-ken, Aichi-ken and Mie-ken); Kinki wide area (district including Shiga-ken, Kyoto-fu, Osaka-fu, Hyogo-ken, Nara-ken and Wakayama-ken); and other prefectural areas (including districts formed by two prefectures, such as Tottori-ken/Shimane-ken and Okayama-ken/Kagawa-ken areas). Those of multiplex TV broadcasting are defined to be "identical to the broadcasting area of each TV broadcasting on which signals are superimposed."

## **2. Program Discipline**

Based on the principle of "freedom of expression" guaranteed in Article 21 of the Constitution, the current Broadcast Law makes it the most important principle to ensure the freedom of broadcast program editing, and defines only the minimum necessary disciplines related to broadcast programs. The provisions include the observance of program editing criteria, maintenance of harmony between programs, establishment of broadcast program deliberation committees, etc.

### **(1) Program Criteria**

Article 3-2, Clause 1 of the Law defines the four criteria that NHK, general broadcast carriers and the University of Air shall observe when editing their broadcast programs as shown below.

1) [The broadcasting] shall not injure the public safety and good manners.

2) Shall be politically impartial.

3) The information shall not deviate from the truth.

4) With problems involving opposite opinions, the broadcasting shall clarify the issue from as many angles as possible.

## **(2) Principle of Harmony**

Article 3-2, Clause 2 and Article 44, Clause 3 of the Law defines that, for TV broadcasting and for AM and FM broadcasting operated by NHK, the broadcast programs should be edited to maintain harmony between programs by containing cultural/educational programs, news programs and entertainment programs. This principle is not applied to media other than those listed above.

## **(3) Program Deliberation Committees**

Article 3-4 of the Law defines that the broadcast carriers should establish broadcast program deliberation committees for the optimization of their programs. However, Article 3-5 of the Law exempts carriers who operate mainly specialized broadcasting and broadcasting for temporary objectives from this provision. The number of program deliberation committee members is set to seven or more by Article 51, Clause 1 of the Law, but this is reduced to five or more for program deliberation committees established by general carriers who mainly operate multiplex broadcasting.

## **(4) Obligation of Set Program Standards**

Article 3-3 of the Law provides that broadcast carriers should set standards for editing broadcast programs in accordance with the types of broadcast programs and people who are the target of the broadcasting, and should edit their programs according to these standards.

For carriers involved in specialized broadcasting and broadcasting for temporary objectives who are exempt from the obligation of establishing program deliberation committees, Article 3-5 of the Law also exempts them from this provision.

## **(5) Obligation of Making Efforts To Complement Programs**

Article 3-2, Clause 4 of the Law provides that broadcast carriers who operate TV broadcasting and multiplex TV broadcasting should edit multiplex TV broadcast programs so that they relate to the TV programs being broadcast simultaneously, and should broadcast as many such multiplex TV broadcast programs as possible to enrich and enhance the effects of the TV programs being broadcast. This provision is applied to carriers operating audio multiplex TV broadcasting and character multiplex TV broadcasting.

### 3. Sources of Business Capital

#### (1) NHK

Article 32 of the Law defines that anyone who installs receiving equipment which can receive NHK broadcasts should conclude a contract with NHK for the reception of its broadcasts and, for the receivers, makes it obligatory to conclude receiving contracts. The fees based on these contracts are the major source of funds for NHK.

Article 46 of the Law prohibits NHK from broadcasting advertising of businesses conducted by other parties, and the provision of the pay system is not applied to it.

#### (2) General Broadcast Carriers

The source of business funds of general carriers used to be exclusively income based on the broadcasting of advertisements. However, after the amendment of the Law in 1988, Article 52-4 of the Law makes general carriers legally capable of operating pay broadcasting by obtaining permission from the Minister of Posts and Telecommunications on the arrangement of the pay system.

At present, the Broadcast Law Enforcement Rule and Basic Project for Popular Broadcasting provide that the pay system is applicable only to satellite broadcasts (TV broadcasting, audio multiplex TV broadcasting, character multiplex TV broadcasting). Its application is still reserved for terrestrial broadcasting.

### 4. Licensing System

Article 2 of the Law defines broadcast carriers who are subject to the broadcast law as "those who are licensed as broadcasting stations in accordance with the provision of Radio Law," and a licensing system which does not discriminate between broadcast facilities and program production is applied uniformly, including multiplex broadcasting. However, for the field of satellite broadcasting, the amendment of the Law in 1989 arranged the licensing system so that licensed operators of radio stations (contract broadcasting business operator) and editors of the broadcasting programs (commissioned broadcasting business operator) can be separated (Chapter 3-2 and Chapter 3-3 of the Law) (enforced on 1 October 1989).

### 5. Other

In addition to the above, the Law also provides for the correction broadcasting accompanying the broadcasting of any item which is not true (Article 4), the post-treatment on broadcast contents (Article 5), consent to re-broadcasting (Article 6) and broadcasting in case of disasters (Article 6-2), as common themes for any broadcasting.

The outline of the current system related to terrestrial multiplex broadcasting systems is as shown in the attached table.

(Attached Table) Outline of Current System Related to Terrestrial Multiplex Broadcasting Systems

Item	TV multiplex broadcasting		FM multiplex broadcasting	
	Audio multiplex broadcast	Character multiplex broadcast	Audio multiplex broadcast	Character multiplex broadcast
1. Subject discipline, etc.				
(1) License subject				
1) In case of superimposition on commercial station signal				
a) Master (TV carrier, FM carrier)	o (Complement only)	o	o	o
b) Third party	x	o	o	o
2) In case of superimposition on NHK signal				
a) NHK	o (Complement only)	o	x	o
b) Third party	x	o	o	o
(2) Application of principle of elimination of mass-medium concentration	x	x	x	x
(3) Broadcasting target area	Same as superimposed TV broadcasting	Same as superimposed TV broadcasting	Same as superimposed FM broadcasting	Same as superimposed FM broadcasting
(4) Elimination of foreign elements	o	o	o	o
2. Program discipline, etc.				
(1) Criteria				

(Attached Table) Outline of Current System Related to Terrestrial Multiplex Broadcasting Systems (Continued)

Item	TV multiplex broadcasting		FM multiplex broadcasting	
1) Program editing criteria	o	o	o	o
2) Harmony principle between programs	x	x	x	x
3) Educational program editing criteria	o	o	o	o
4) Obligation of setting of program standards	o	o	o	o
5) Obligation of establishment of broadcast program deliberation committee	Δ (Alleviated) (Note 1)	Δ (Alleviated) (Note 1)	Δ (Alleviated) (Note 1)	Δ (Alleviated) (Note 1)
6) Exemption from obligation to establish program deliberation committee, etc., for specialized broadcasts and broadcasts with temporary objective	o	o	o	o
7) Corrective broadcast	o	o	o	o
8) Post-treatment of broadcast contents	o	o	o	o
9) Consent of re-broadcast	o	o	o	o
10) Disaster broadcast	o	o	o	o
(2) NHK				
1) Rich and good programs	o	o	-	o
2) National programs + local programs	o	o	-	o
3) Preservation, cultivation and diffusion of culture	o	o	-	o
4) Candidate broadcast	o	o	-	o
5) Prohibition of commercials	o	o	-	o
(3) Commercial stations				
1) Identification of commercial broadcasts	o	o	o	o
2) Candidate broadcast	o	o	o	o
3) Restriction of commercials in broadcasting for schools	o	o	o	o
4) Restriction of agreement on broadcast program supply	o	o	o	o
(4) Modes of utilization (Independent use, complementary use)				
1) Master (TV carrier, FM carrier)	Complementary use only	Obligation of efforts for complement + Independent use possible for rest	Free	Free
2) Third party	-	Free	Free	Free
3. Source of business capital				
(1) Advertising broadcast				
1) NHK	x	x	-	x
2) Commercial stations	o	o	o	o



(Attached Table) Outline of Current System Related to Terrestrial Multiplex Broadcasting Systems (Continued)

Item	TV multiplex broadcasting		FM multiplex broadcasting	
(2) Pay broadcast				
1) NHK	x	x	-	x
2) Commercial stations	x (Note 2)	x (Note 2)	x (Note 2)	x (Note 2)
4. Licensing system				
Discrimination/no discrimination between facilities and production	No discrimination	No discrimination	No discrimination	No discrimination
5. Other				
(1) Establishment and submission of multiplex broadcasting program	o	o	o	o
(2) Obligation of diffusion				
1) Obligation of nationwide diffusion (NHK)	x (Note 3)	x (Note 3)	-	x (Note 3)
2) Obligation of efforts for maximum diffusion within target area	o	o	o	o

(Note 1) Alleviation of application is for commercial broadcasting stations who operate exclusively multiplex broadcasting.

(Note 2) The possibility is legally open, but not permitted by the Basic Project for Popular Broadcasting.

(Note 3) However, the obligation to make efforts is regarded to exist within the limits of the objective of establishment of NHK.

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